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SECTION I.—AEROLOGY.

THE ERUPTION OF SAKURASHIMA, JANUARY, 1914.

In view of the great interest which violent volcanic explosions have for the modern student of insolation, atmospheric transmissibility, and sky polarization, it seems appropriate for this REVIEW to present briefly the important features of the eruption of Sakurashima so far as they bear upon such problems.

Southern Japan has a great group of volcanoes called Kirishima. Southwestward from that group stretches a volcanic zone along the inner line of the Riukiu arc, and this zone also bears the general name Kirishima. Sakurashima is a volcanic island of this zone, situated in the graben which forms the Bay of Kagoshima, and its volcanoes are the first of those in the zone stretching southwestward from the Kirishima group.

The conical island of Sakurashima, 8½ kilometers from north to south and 11 kilometers from east to west, is built of three volcanic cones, lying so close together along its meridian that from the base they appear as a single cone. From one of the summits the individual cones may be clearly distinguished. The northern volcano is called Mitake or Kita-dake, i. e., Northern Peak; its rim is 1,133 meters above sea level; its crater is 300 meters in diameter and 100 meters deep. The southern volcano is called Minami-dake, or Southern Peak, and has always been active during historic times, giving off a light smoke or steam. Its elliptical crater is 650 by 400 meters, bounded by extraordinarily steep and even perpendicular walls, and the rim stands at an altitude of 1,070 meters above sea level. Between these two lies the third cone, called Nake-dake, or Middle Peak, having a smaller crater that is but 30 meters deep and a correspondingly shallow rim. Other lateral and parasitic cones are also present.

This island of volcanoes is among the most famous of Japan. Historic recorded eruptions go back to 708 A. D., since when at least 20 outbreaks have occurred. Among these the most violent were in 1471–1476 and 1779–1781. The eruption of 1780 was accompanied by a submarine outbreak on the northeast of the island which resulted in the formation of new islands and reefs. During the past 135 years there have been over 10 small outbreaks, and smoke clouds were still ascending from Minami-dake when Prof. Yamasaki's¹ paper was transmitted to the Berlin Geographical Society.

The eruption of January, 1914, was one of the most important lava eruptions of modern times, comparable with its own predecessor of 1779 and that of Asama in 1783. The great eruption of Bandai-san in 1888 was a great steam explosion, and no trace of accompanying lava flows was found. The eruption of Sakurashima of the present year was of the normal lava type, as usually occurring at Vesuvius and Etna. It was immediately preceded by numerous earth shocks on January 10, which greatly increased in number on the 11th. Thus the inhabitants of the island and of Kagoshima had sufficient time to flee to points of safety. Early on the morning of

January 12 "smoke" was seen hanging upon the western slopes far below the active crater of Minami-dake. About 10 a. m. there was a tremendous eruption precisely underneath the "smoke," and almost simultaneously came another great eruption on the opposite side of the island. Great masses of steam, darkened by their great load of volcanic ashes and lapilli, rose to great heights. The "smoke" column, made up of thousands of cloud balls, is estimated to have risen to at least 6,000 meters (19,685 feet, or 3.7 miles). Lightning flashes darted in all directions, vertically as well as horizontally and obliquely, within the gray cloud. The heavy concussions and the ash fall greatly changed the landscape. Near the crater the forest trees were stripped of their leaves, branches were bent over, and even strong stems and trunks were broken off. The side of the trees toward the crater suffered complete abrasion of bark and rind, so that only the naked stem remained. In Yokohama the air waves tore up by the roots a well-grown orange tree and carried it up on a hill 60 meters above its former position.

The lofty column of "smoke" spread out in the upper layers of the atmosphere, scattering its ashes far eastward under the influence of the west wind then prevailing. The ash fall not only covered the larger portion of the island of Kiushiu, but also fell upon Shikoku and at various points on Hondo, the principal of the Japanese islands. Early on the morning of January 13, the third day of the eruption, there was a thin fall of ashes at Tokyo, which is about 1,000 kilometers or over 620 miles, from Sakurashima.—[O. A., jr.]

SOLAR RADIATION INTENSITIES AT MOUNT WEATHER, VA.

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[Dated Mount Weather, Va., Apr. 17, 1914.]

In Table 1 are summarized the solar radiation measurements made at Mount Weather, Va., with a Marvin pyrheliometer, during January, February, and March, 1914. Measurements have been made with the sun at approximately the following zenith distances whenever it was unobscured by clouds: 80.7°, 79.8°, 78.7°, 77.4°, 75.7°, 73.6°, 70.7°, 66.5°, 60.0°, and 58.3°. The corresponding air masses are 6.0, 5.5, 5.0, 4.5, 4.0, 3.5, 3.0, 2.5, 2.0, and 1.5 (1). Eight readings of the pyrheliometer at minute intervals are usually made, and the results are plotted with the logarithms of the measured radiation intensities as ordinates and the air masses as abscissas. Interpolation of radiation intensities to a zenith distance of the sun corresponding to an air mass that is some multiple of 0.5 is then a simple matter. The exact zenith distance of the sun corresponding to the true solar time at which a pyrheliometric reading was made is determined by the aid of Ball's altitude tables (2).

The Marvin pyrheliometer has been compared frequently with Smithsonian silver disk pyrheliometer No. 1, and the latter has been checked from time to time with pyrheliometers in use at the astrophysical observatory

¹ Yamasaki, N. Der Ausbruch des Vulkans Sakurashima im Januar, 1914. Ztschr. d. Gesells. f. Erdkunde, Berlin, 1914, No. 4, pp. 295–302, with map.